REMARKS

I.   Status of the Application.

Claims 1 through 33 were pending in the original application. In an Office Action dated May 7, 2003 (the "first Office Action"), the Examiner: (i) rejected Claims 1-22, 24-31, and 33 under 35 U.S.C. §102(a) as being anticipated by the article entitled "Speeding Up Secret Computations with Insecure Auxiliary Devices" by Matsumoto et al. (the "Matsumoto reference"); (ii) rejected Claims 1-2, 13-14, 18, 20, 24-25, and 28-29 under 35 U.S.C. §102(a) as being anticipated by the article entitled "Fast Server-Aided Secret Computation Protocols for Modular Exponentiation" by Kawamura et al. (the "Kawamura reference"); (iii) rejected Claims 1-2, 13-14, 18, 20, 24-25, and 28-29 under 35 U.S.C. §103(a) as being unpatentable over the article entitled "Netsolve: An Network for Solving Computational Science Problems" by Casanova et al. (the "Casanova reference"), and further in view of the article entitled "On Hiding Information from an Oracle" by Abadi et al. (the "Abadi reference"); and (iv) objected to Claims 23 and 33 as being dependent upon a rejected base claim, but indicated that Claims 23 and 33 would be allowable if rewritten in independent form, including all of the limitations of the base claims and any intervening claims.

In a response to the first Office Action dated October 6, 2003, Applicants: (i) canceled Claims 3, 13-17, and 24-27; (ii) amended Claims 1, 4-5, 7-12, 18-19, 28, and 30; (iii) traversed the rejections of Claims 2, 6, 20-23, 29 and 31-33; and (iv) submitted new Claims 34-82.

In a final Office Action dated March 8, 2004, the Examiner: (i) rejected Claims 1-22, 24-31, 33, 35 and 34-49 under 35 U.S.C. §102(a) as being anticipated by Matsumoto reference; (ii)

rejected Claims 1-2, 13-14, 18, 20, 24-25, 28-29, and 37-49 under 35 U.S.C. §102(a) as being anticipated by the Kawamura reference; (iii) rejected Claims 1-2, 13-14, 18, 20, 24-25, 28-29, and 37-49 under 35 U.S.C. §103(a) as being unpatentable over the Casanova reference in view of the Abadi reference; and (iv) rejected Claims 50-82 under 35 U.S.C. §101 as being directed to non-statutory subject matter.

In an in-person interview with Examiner Smithers on May 4, 2004, Applicants discussed the claims rejections in view of the prior art cited by the Examiner. In the Interview Summary dated May 19, 2004, the Examiner further clarified that Claims 23, 32, and 36 should have been marked as "objected to" in the March 8, 2004 Office Action, and remarked that Claim 34 should have been marked as "allowable" in the March 8, 2004 Office Action.

Applicants herein respectfully: (i) cancel claims 4-5, 19, and 30-31; (ii) amend Claims 1-2, 6-12, 18, 28, 33, 37, 38-40, 43-45, and 48-82; and (iii) submit new Claims 83-89. Claims 1-2, 6-12, 18, 20-23, 28-29, and 32-89 remain in the application following these amendments.

Ample support may be found throughout Applicants' specification for the amendments to Claims 1-2, 6-12, 18, 28, 33, 37, 38-40, 43-45, and 48-82. No new matter has been added by the amendments made to these claims. Likewise, ample support may be found throughout Applicants' specification for new Claims 83-89. No new matter has been added by these new claims.

II.   Interview.

On May 4, 2004, an in-person interview was conducted with the Examiner, Matthew Smithers. Applicants wish to thank Mr. Smithers for his time and attention during the interview.

As documented in the Interview Summary, the Matsumoto, Kawamura, Casanova, and Abadi references were discussed during the interview, as were the distinctions between these references and Applicants' claims.

III.   Claims not Anticipated by the Matsumoto Reference or the Kawamura Reference.

A. Claim 1.

The Examiner rejected Claim 1 as being anticipated by both the Matsumoto reference and the Kawamura reference under 35 U.S.C. § 102(a). An amendment to Claim 1 is submitted herewith.

1. The Matsumoto Reference.

In support of his rejection of Claim 1 in view of the Matsumoto reference, the Examiner cited Paragraphs 3 and 4 of the Matsumoto reference as disclosing the invention claimed by the Applicants in Claim 1. Paragraph 3 of the Matsumoto reference discloses a technique for decomposing a computation into smaller computations that can be executed more efficiently. Paragraph 4 discloses the use of permutation to disguise matrix multiplication computations, linear equation computations, and graph isomorphism computations. It is respectfully submitted that Claim 1 is not anticipated by either Paragraph 3 or Paragraph 4 of the Matsumoto reference.

"A claim is anticipated only if each and every [limitation] as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." MPEP § 2131 (citing Verdegaal Bros., 814 F.2d 628, 631 (Fed. Cir. 1987)). Claim 1, as amended, includes limitations not found in the Matsumoto reference. Specifically, Claim 1, as amended, includes the limitation:

> "classifying, with a first computer, said outsourced computation into at least one computation type, said at least one computation type being selected from the group consisting of quadrature computations, image edge detection computations, convolution computations, character string pattern matching computations, sorting computations, and computations for solving one or more differential equations."

It is respectfully submitted that the Matsumoto reference makes no disclosure at all of the use of a computer to classify an outsourced computation. Even assuming, for the sake of argument, that the Matsumoto reference makes such a disclosure, it is respectfully submitted that the Matsumoto reference makes no disclosure of the use of a computer to classify an outsourced computation into any of the classification types recited in this limitation of Claim 1. Accordingly, it is respectfully submitted that Claim 1, as amended, is not anticipated by the Matsumoto reference.

2. The Kawamura Reference.

The Kawamura reference discloses a client-server protocol for reducing computation time for modular exponentiation problems. The disclosure of the Kawamura reference is limited to problems involving modular exponentiation.

Claim 1, as amended, does not claim coverage of problems involving modular

exponentiation. Claim 1, as amended, includes the limitation:

> "classifying, with a first computer, said outsourced computation into at least one
> computation type, said at least one computation type being selected from the
> group consisting of quadrature computations, image edge detection computations,
> convolution computations, character string pattern matching computations,
> sorting computations, and computations for solving one or more differential
> equations."

It is respectfully submitted that the Kawamura reference makes no disclosure at all of the

use of a computer to classify an outsourced computation. Even assuming, for the sake of

argument, that the Kawamura reference makes such a disclosure, it is respectfully submitted that

the Kawamura reference makes no disclosure of the use of a computer to classify an outsourced

computation into any of the classification types recited in this limitation of Claim 1, as the

disclosure of the Kawamura reference is limited to problems involving modular exponentiation.

Accordingly, it is respectfully submitted that Claim 1, as amended, is not anticipated by the

Kawamura reference.

B. Claim 2.

The Examiner rejected Claim 2 as being anticipated by both the Matsumoto reference and

the Kawamura reference under 35 U.S.C. § 102(a). An amendment to Claim 2 is submitted

herewith, although this amendment is not made for reasons related to the patentability of Claim

2.

1. The Matsumoto Reference.

Claim 2 depends from Claim 1. Thus, Claim 2 inherits the limitations of Claim 1.

Section III.A.1 hereof explains why the limitation:

> "classifying, with a first computer, said outsourced computation into at least one computation type, said at least one computation type being selected from the group consisting of quadrature computations, image edge detection computations, convolution computations, character string pattern matching computations, sorting computations, and computations for solving one or more differential equations."

which appears in Claim 1, as amended, is not found in the Matsumoto reference. As Claim 2 inherits the limitations of Claim 1, it is respectfully submitted that this limitation also is not found in Claim 2. Accordingly, it is respectfully submitted that Claim 2 is not anticipated by the Matsumoto reference.

2. The Kawamura Reference.

Claim 2 depends from Claim 1. Thus, Claim 2 inherits the limitations of Claim 1.

Section III.A.2 hereof explains why the limitation:

> "classifying, with a first computer, said outsourced computation into at least one computation type, said at least one computation type being selected from the group consisting of quadrature computations, image edge detection computations, convolution computations, character string pattern matching computations, sorting computations, and computations for solving one or more differential equations."

which appears in Claim 1, as amended, is not found in the Kawamura reference. As Claim 2 inherits the limitations of Claim 1, it is respectfully submitted that this limitation also is not found in Claim 2. Accordingly, it is respectfully submitted that Claim 2 is not anticipated by the Kawamura reference.

C. Claim 6.

The Examiner rejected Claim 6 as being anticipated by the Matsumoto reference under 35 U.S.C. § 102(a). An amendment to Claim 6 is submitted herewith, although this amendment is not made for reasons related to the patentability of Claim 6.

1. The Matsumoto Reference.

Claim 6 depends from Claim 1. Thus, Claim 6 inherits the limitations of Claim 1. Section III.A.1 hereof explains why the limitation:

> "classifying, with a first computer, said outsourced computation into at least one computation type, said at least one computation type being selected from the group consisting of quadrature computations, image edge detection computations, convolution computations, character string pattern matching computations, sorting computations, and computations for solving one or more differential equations."

which appears in Claim 1, as amended, is not found in the Matsumoto reference. As Claim 6 inherits the limitations of Claim 1, it is respectfully submitted that this limitation also is not found in Claim 6. Accordingly, it is respectfully submitted that Claim 6 is not anticipated by the Matsumoto reference.

D. Claim 7.

The Examiner rejected Claim 7 as being anticipated by the Matsumoto reference under 35 U.S.C. § 102(a). An amendment to Claim 7 is submitted herewith.

1. The Matsumoto Reference.

Claim 7 depends from Claim 1. Claim 1 includes the limitation:

"classifying, with a first computer, said outsourced computation into at least one computation type, said at least one computation type being selected from the group consisting of quadrature computations, image edge detection computations, convolution computations, character string pattern matching computations, sorting computations, and computations for solving one or more differential equations;"

and the limitation:

"performing said one or more selected disguising operations on said actual arguments with said first computer to provide disguised arguments."

Claim 7 includes the limitation:

"wherein said step of performing said one or more selected disguising operations comprises the step of generating a plurality of pseudorandom numbers, each of said plurality of pseudorandom numbers being generated by one of a number of pseudorandom number generation techniques, said techniques each comprising a different distribution parameter."

Section III.A.1 hereof explains why a "classifying" step is not found in the Matsumoto reference. It is respectfully submitted that the Matsumoto reference also does not disclose a method that includes <u>both</u> a "classifying" step and a "performing" step, wherein the "performing" step comprises "generating a plurality of pseudorandom numbers" as is claimed in Claim 7. Accordingly, it is respectfully submitted that Claim 7 is not anticipated by the Matsumoto reference.

E. **Claim 8.**

The Examiner rejected Claim 8 as being anticipated by the Matsumoto reference under

35 U.S.C. § 102(a). An amendment to Claim 8 is submitted herewith.

1. **The Matsumoto Reference.**

Claim 8 depends from Claim 1 and Claim 7. Claim 1 includes the limitation:

"classifying, with a first computer, said outsourced computation into at least one
computation type, said at least one computation type being selected from the
group consisting of quadrature computations, image edge detection computations,
convolution computations, character string pattern matching computations,
sorting computations, and computations for solving one or more differential
equations;"

and the limitation:

"performing said one or more selected disguising operations on said actual
arguments with said first computer to provide disguised arguments."

Claim 7 includes the limitation:

"wherein said step of performing said one or more selected disguising operations
comprises the step of generating a plurality of pseudorandom numbers, each of
said plurality of pseudorandom numbers being generated by one of a number of
pseudorandom number generation techniques, said techniques each comprising a
different distribution parameter."

Claim 8 includes the limitation:

"wherein said step of performing said one or more selected disguising operations
comprises defining a number of disguise functions with one or more of said
pseudorandom numbers."

Section III.A.1 hereof explains why a "classifying" step is not found in the Matsumoto

reference. Section III.D.1 hereof explains why the Matsumoto reference also does not disclose a

method that includes both a "classifying" step and a "performing" step, wherein the "performing"

step comprises "generating a plurality of pseudorandom numbers." It also is respectfully submitted that the Matsumoto reference does not disclose a method that includes both a "classifying" step and a "performing" step, wherein the "performing" step comprises "generating a plurality of pseudorandom numbers" and "defining a number of disguise functions with one or more of said pseudorandom numbers" as is claimed in Claim 8. Accordingly, it is respectfully submitted that Claim 8 is not anticipated by the Matsumoto reference.

F. Claim 9.

The Examiner rejected Claim 9 as being anticipated by the Matsumoto reference under 35 U.S.C. § 102(a). An amendment to Claim 9 is submitted herewith.

1. The Matsumoto Reference.

Claim 9 depends from Claim 1. Claim 1 includes the limitation:

"classifying, with a first computer, said outsourced computation into at least one computation type, said at least one computation type being selected from the group consisting of quadrature computations, image edge detection computations, convolution computations, character string pattern matching computations, sorting computations, and computations for solving one or more differential equations;"

and the limitation:

"performing said one or more selected disguising operations on said actual arguments with said first computer to provide disguised arguments."

Claim 9 includes the limitation:

"wherein said step of performing said one or more selected disguising operations comprises modifying a linear operator."

Section III.A.1 hereof explains why a "classifying" step is not found in the Matsumoto reference: It is respectfully submitted that the Matsumoto reference also does not disclose a method that includes both a "classifying" step and a "performing" step, wherein the "performing" step comprises "modifying a linear operator" as is claimed in Claim 9. Accordingly, it is respectfully submitted that Claim 9 is not anticipated by the Matsumoto reference.

G. Claim 10.

The Examiner rejected Claim 10 as being anticipated by the Matsumoto reference under 35 U.S.C. § 102(a). An amendment to Claim 10 is submitted herewith.

1. The Matsumoto Reference.

Claim 10 depends from Claim 1. Claim 1 includes the limitation:

"classifying, with a first computer, said outsourced computation into at least one computation type, said at least one computation type being selected from the group consisting of quadrature computations, image edge detection computations, convolution computations, character string pattern matching computations, sorting computations, and computations for solving one or more differential equations;"

and the limitation:

"performing said one or more selected disguising operations on said actual arguments with said first computer to provide disguised arguments."

Claim 10 includes the limitation:

"wherein said step of performing said one or more selected disguising operations comprises altering a dimension corresponding to said actual arguments to provide said disguised arguments."

Section III.A.1 hereof explains why a "classifying" step is not found in the Matsumoto reference: It is respectfully submitted that the Matsumoto reference also does not disclose a method that includes <u>both</u> a "classifying" step and a "performing" step, wherein the "performing" step comprises "altering a dimension corresponding to said actual arguments to provide said disguised arguments" as is claimed in Claim 10. Accordingly, it is respectfully submitted that Claim 10 is not anticipated by the Matsumoto reference.

H. **Claim 11.**

The Examiner rejected Claim 11 as being anticipated by the Matsumoto reference under 35 U.S.C. § 102(a). An amendment to Claim 11 is submitted herewith. This amendment is not made for reasons relating to the patentability of Claim 11.

1. **The Matsumoto Reference.**

Claim 11 depends from Claim 1 and Claim 10. Claim 1 includes the limitation:

"classifying, with a first computer, said outsourced computation into at least one computation type, said at least one computation type being selected from the group consisting of quadrature computations, image edge detection computations, convolution computations, character string pattern matching computations, sorting computations, and computations for solving one or more differential equations;"

and the limitation:

"performing said one or more selected disguising operations on said actual arguments with said first computer to provide disguised arguments."

Claim 10 includes the limitation:

"wherein said step of performing said one or more selected disguising operations comprises altering a dimension corresponding to said actual arguments to provide said disguised arguments."

Claim 11 includes the limitation:

"wherein said altering comprises expanding said dimension."

Section III.A.1 hereof explains why a "classifying" step is not found in the Matsumoto reference. Section III.G.1 hereof explains why the Matsumoto reference does not disclose a method that includes both a "classifying" step and a "performing" step, wherein the "performing" step comprises "altering a dimension corresponding to said actual arguments to provide said disguised arguments." It is respectfully submitted that the Matsumoto reference also does not disclose a method that includes both a "classifying" step and a "performing" step, wherein the "performing" step comprises "altering a dimension corresponding to said actual arguments" and wherein the altering step "comprises expanding said dimension" as is claimed in Claim 11. Accordingly, it is respectfully submitted that Claim 11 is not anticipated by the Matsumoto reference.

I. Claim 12.

The Examiner rejected Claim 12 as being anticipated by the Matsumoto reference under 35 U.S.C. § 122(a). An amendment to Claim 12 is submitted herewith.

1. The Matsumoto Reference.

Claim 12 depends from Claim 1. Claim 1 includes the limitation:

"classifying, with a first computer, said outsourced computation into at least one computation type, said at least one computation type being selected from the group consisting of quadrature computations, image edge detection computations, convolution computations, character string pattern matching computations, sorting computations, and computations for solving one or more differential equations;"

and the limitation:

"performing said one or more selected disguising operations on said actual arguments with said first computer to provide disguised arguments."

Claim 12 includes the limitation:

"wherein said step of performing said one or more selected disguising operations comprises performing a function substitution in accordance with at least one mathematical identity."

Section III.A.1 hereof explains why a "classifying" step is not found in the Matsumoto reference: It is respectfully submitted that the Matsumoto reference also does not disclose a method that includes both a "classifying" step and a "performing" step, wherein the "performing" step comprises "performing a function substitution in accordance with at least one mathematical identity" as is claimed in Claim 12. Accordingly, it is respectfully submitted that Claim 12 is not anticipated by the Matsumoto reference.

J. Claim 18.

The Examiner rejected Claim 18 as being anticipated by both the Matsumoto reference and the Kawamura reference under 35 U.S.C. § 102(a). An amendment to Claim 18 is submitted herewith.

1. The Matsumoto Reference.

In support of his rejection of Claim 18 in view of the Matsumoto reference, the Examiner

cited Paragraphs 3 and 4 of the Matsumoto reference as disclosing the invention claimed by the

Applicants in Claim 18. Paragraph 3 of the Matsumoto reference discloses a technique for

decomposing a computation into smaller computations that can be executed more efficiently.

Paragraph 4 discloses the use of permutation to disguise matrix multiplication computations,

linear equation computations, and graph isomorphism computations. It is respectfully submitted

that Claim 18 is not anticipated by either Paragraph 3 or Paragraph 4 of the Matsumoto

reference.

"A claim is anticipated only if each and every [limitation] as set forth in the claim is

found, either expressly or inherently described, in a single prior art reference." MPEP § 2131

(citing Verdegaal Bros., 814 F.2d 628, 631 (Fed. Cir. 1987)). Claim 18, as amended, includes

limitations not found in the Matsumoto reference. Specifically, Claim 18, as amended, includes

the limitation:

> "said computer being programmed to classify said computation into at least one
> computation type, said at least one computation type being selected from the
> group consisting of quadrature computations, image edge detection computations,
> convolution computations, character string pattern matching computations,
> sorting computations, and computations for solving one or more differential
> equations."

It is respectfully submitted that the Matsumoto reference makes no disclosure of a

computer programmed to classify computations in this fashion. Even assuming, for the sake of

argument, that the Matsumoto reference makes such a disclosure, it is respectfully submitted that

the Matsumoto reference makes no disclosure of a computer programmed to classify computations into any of the classification types recited in this limitation of Claim 18. Accordingly, it is respectfully submitted that Claim 18, as amended, is not anticipated by the Matsumoto reference.

2. The Kawamura Reference.

The Kawamura reference discloses a client-server protocol for reducing computation time for modular exponentiation problems. The disclosure of the Kawamura reference is limited to problems involving modular exponentiation. Claim 18, as amended, does not claim coverage of problems involving modular exponentiation. Claim 18, as amended, includes the limitation:

> "said computer being programmed to classify said computation into at least one computation type, said at least one computation type being selected from the group consisting of quadrature computations, image edge detection computations, convolution computations, character string pattern matching computations, sorting computations, and computations for solving one or more differential equations."

It is respectfully submitted that the Kawamura reference makes no disclosure of a computer programmed to classify computations in this fashion. Even assuming, for the sake of argument, that the Kawamura reference makes such a disclosure, it is respectfully submitted that the Kawamura reference makes no disclosure of a computer programmed to classify computations into any of the classification types recited in this limitation of Claim 18, as the Kawamura reference deals only with problems involving modular exponentiation. Accordingly, it is respectfully submitted that Claim 18, as amended, is not anticipated by the Kawamura reference.

K. Claim 20.

The Examiner rejected Claim 20 as being anticipated by both the Matsumoto reference

and the Kawamura reference under 35 U.S.C. § 102(a).

1. The Matsumoto Reference.

Claim 20 depends from Claim 18. Claim 18 includes the limitation:

"said computer being programmed to classify said computation into at least one
computation type, said at least one computation type being selected from the
group consisting of quadrature computations, image edge detection computations,
convolution computations, character string pattern matching computations,
sorting computations, and computations for solving one or more differential
equations."

Claim 20 includes the limitation:

"further comprising a computing center, said computing center being programmed
to perform said outsourced computation with said disguised arguments."

Section III.J.1 hereof explains why a "computer ... programmed to classify" is not found

in the Matsumoto reference. It is respectfully submitted that the Matsumoto reference also does

not disclose a system that includes both a "computer ... programmed to classify" and a

"computing center ... programmed to perform said outsourced computation with said disguised

arguments" as is claimed in Claim 20. Accordingly, it is respectfully submitted that Claim 20 is

not anticipated by the Matsumoto reference.

2. The Kawamura Reference.

Claim 20 depends from Claim 18. Claim 18 includes the limitation:

"said computer being programmed to classify said computation into at least one computation type, said at least one computation type being selected from the group consisting of quadrature computations, image edge detection computations, convolution computations, character string pattern matching computations, sorting computations, and computations for solving one or more differential equations."

Claim 20 includes the limitation:

"a computing center, said computing center being programmed to perform said outsourced computation with said disguised arguments."

Section III.J.2. hereof explains why a "computer ... programmed to classify" is not found in the Kawamura reference. It is respectfully submitted that the Kawamura reference also does not disclose a system that includes both a "computer ... programmed to classify" and a "computing center ... programmed to perform said outsourced computation with said disguised arguments" as is claimed in Claim 20. Accordingly, it is respectfully submitted that Claim 20 is not anticipated by the Kawamura reference.

L. **Claim 21.**

The Examiner rejected Claim 21 as being anticipated by the Matsumoto reference under 35 U.S.C. § 102(a).

1. **The Matsumoto Reference.**

Claim 21 depends from Claim 18. Claim 18 includes the limitation:

"said computer being programmed to classify said computation into at least one computation type, said at least one computation type being selected from the group consisting of quadrature computations, image edge detection computations, convolution computations, character string pattern matching computations,

sorting computations, and computations for solving one or more differential equations."

Claim 21 includes the limitation:

"wherein said computer includes a memory, a library of disguise operations being stored in said memory."

Section III.J.1 hereof explains why a "computer ... programmed to classify" is not found in the Matsumoto reference. It is respectfully submitted that the Matsumoto reference also does not disclose a system that includes <u>both</u> a "computer ... programmed to classify" and a "library of disguise operations" stored in the memory of the "computer ... programmed to classify" as is claimed in Claim 21. Accordingly, it is respectfully submitted that Claim 21 is not anticipated by the Matsumoto reference.

M. Claim 22.

The Examiner rejected Claim 22 as being anticipated by the Matsumoto reference under 35 U.S.C. § 102(a).

1. The Matsumoto Reference.

Claim 22 depends from Claim 18 and Claim 21. Claim 18 includes the limitation:

"said computer being programmed to classify said computation into at least one computation type, said at least one computation type being selected from the group consisting of quadrature computations, image edge detection computations, convolution computations, character string pattern matching computations, sorting computations, and computations for solving one or more differential equations."

Claim 21 includes the limitation:

"wherein said computer includes a memory, a library of disguise operations being stored in said memory."

Claim 22 includes the limitation:

"wherein said disguise operations correspond to at least one of the group consisting of random object generation, argument dimension modification, mathematical identity substitution, and disguise function generation."

Section III.L.1 hereof explains why a combination of a "computer ... programmed to classify" and a "library of disguise operations" stored in the memory of the "computer ... programmed to classify" is not found in the Matsumoto reference. It is respectfully submitted that the Matsumoto reference also does not disclose a system that includes both a "computer ... programmed to classify" and a "library of disguise operations" stored in the memory of the "computer ... programmed to classify," wherein the disguise operations in the library "correspond to at least one of the group consisting of random object generation, argument dimension modification, mathematical identity substitution, and disguise function generation" as is claimed in Claim 22. Accordingly, it is respectfully submitted that Claim 22 is not anticipated by the Matsumoto reference.

N. Claim 23.

The Examiner rejected Claim 23 as being anticipated by the Matsumoto reference under 35 U.S.C. § 102(a).

1. The Matsumoto Reference.

Claim 23 depends from Claim 18. Claim 18 includes the limitation:

"said computer being programmed to classify said computation into at least one computation type, said at least one computation type being selected from the group consisting of quadrature computations, image edge detection computations, convolution computations, character string pattern matching computations, sorting computations, and computations for solving one or more differential equations."

Claim 23 includes the limitation:

"wherein said computer includes instructions to generate a cubic spline to provide a disguise for said actual arguments."

Section III.J.1 hereof explains why a "computer ... programmed to classify" is not found in the Matsumoto reference. It is respectfully submitted that the Matsumoto reference also does not disclose a system that includes both a "computer ... programmed to classify" and "instructions to generate a cubic spline to provide a disguise for said actual arguments" stored in the memory of the "computer ... programmed to classify" as is claimed in Claim 23. Accordingly, it is respectfully submitted that Claim 23 is not anticipated by the Matsumoto reference.

O. Claim 28.

The Examiner rejected Claim 28 as being anticipated by the Matsumoto reference under 35 U.S.C. § 102(a). An amendment to Claim 28 is submitted herewith.

1. The Matsumoto Reference.

In support of his rejection of Claim 28 in view of the Matsumoto reference, the Examiner cited Paragraphs 3 and 4 of the Matsumoto reference as disclosing the invention claimed by the Applicants in Claim 28. Paragraph 3 of the Matsumoto reference discloses a technique for

decomposing a computation into smaller computations that can be executed more efficiently.

Paragraph 4 discloses the use of permutation to disguise matrix multiplication computations,

linear equation computations, and graph isomorphism computations. It is respectfully submitted

that Claim 28 is not anticipated by either Paragraph 3 or Paragraph 4 of the Matsumoto

reference.

"A claim is anticipated only if each and every [limitation] as set forth in the claim is

found, either expressly or inherently described, in a single prior art reference." MPEP § 2131

(citing Verdegaal Bros., 814 F.2d 628, 631 (Fed. Cir. 1987)). Claim 28, as amended, includes

limitations not found in the Matsumoto reference. Specifically, Claim 28, as amended, includes

the limitation:

> "a computer readable medium, said medium defining programming instructions
> ... said programming instructions being operable to classify said computation into
> at least one computation type, said at least one computation type being selected
> from the group consisting of quadrature computations, image edge detection
> computations, convolution computations, character string pattern matching
> computations, sorting computations, and computations for solving one or more
> differential equations."

It is respectfully submitted that the Matsumoto reference makes no disclosure of a

computer readable medium defining programming instructions operable to classify a

computation. Even assuming, for the sake of argument, that the Matsumoto reference makes

such a disclosure, it is respectfully submitted that the Matsumoto reference makes no disclosure

of a computer readable medium defining programming instructions operable to classify a

computation into any of the classification types recited in this limitation of Claim 28.

Accordingly, it is respectfully submitted that Claim 28, as amended, is not anticipated by the

Matsumoto reference.

2. **The Kawamura Reference.**

The Kawamura reference discloses a client-server protocol for reducing computation time

for modular exponentiation problems. The disclosure of the Kawamura reference is limited to

problems involving modular exponentiation. Claim 28, as amended, does not cover problems

involving modular exponentiation. Claim 28, as amended, includes the limitation:

> "a computer readable medium, said medium defining programming instructions
> ... said programming instructions being operable to classify said computation into
> at least one computation type, said at least one computation type being selected
> from the group consisting of quadrature computations, image edge detection
> computations, convolution computations, character string pattern matching
> computations, sorting computations, and computations for solving one or more
> differential equations."

It is respectfully submitted that the Kawamura reference makes no disclosure of a

computer readable medium defining programming instructions operable to classify a

computation. Even assuming, for the sake of argument, that the Kawamura reference makes

such a disclosure, it is respectfully submitted that the Kawamura reference makes no disclosure

of computer readable medium defining programming instructions operable to classify a

computation into any of the classification types recited in this limitation of Claim 28, as its

disclosure is limited to problems involving modular exponentiation. Accordingly, it is

respectfully submitted that Claim 28, as amended, is not anticipated by the Kawamura reference.

P. Claim 29.

The Examiner rejected Claim 29 as being anticipated by both the Matsumoto reference

and the Kawamura reference under 35 U.S.C. § 102(a).

1. The Matsumoto Reference.

Claim 29 depends from Claim 28. Claim 28 includes the limitation:

"a computer readable medium, said medium defining programming instructions
... said programming instructions being operable to classify said computation into
at least one computation type, said at least one computation type being selected
from the group consisting of quadrature computations, image edge detection
computations, convolution computations, character string pattern matching
computations, sorting computations, and computations for solving one or more
differential equations."

Claim 29 includes the limitation:

"further comprising a computer responsive to said programming instructions."

Section III.O.1 hereof explains why a "computer readable medium ... defining

programming instructions ... said programming instructions being operable to classify" is not

found in the Matsumoto reference. It is respectfully submitted that the Matsumoto reference also

does not disclose a system that includes both a "computer readable medium ... defining

programming instructions ... said programming instructions being operable to classify" and a

"computer responsive to said programming instructions" as is claimed in Claim 29.

Accordingly, it is respectfully submitted that Claim 29 is not anticipated by the Matsumoto

reference.

2. The Kawamura Reference.

Claim 29 depends from Claim 1. Claim 1 includes the limitation:

"a computer readable medium, said medium defining programming instructions ... said programming instructions being operable to classify said computation into at least one computation type, said at least one computation type being selected from the group consisting of quadrature computations, image edge detection computations, convolution computations, character string pattern matching computations, sorting computations, and computations for solving one or more differential equations."

Claim 29 includes the limitation:

"further comprising a computer responsive to said programming instructions."

Section III.O.2. hereof explains why a "computer readable medium ... defining programming instructions ... said programming instructions being operable to classify" is not found in the Kawamura reference. It is respectfully submitted that the Kawamura reference also does not disclose a system that includes <u>both</u> a "computer readable medium ... defining programming instructions ... said programming instructions being operable to classify" and a "computer responsive to said programming instructions" as is claimed in Claim 29. Accordingly, it is respectfully submitted that Claim 29 is not anticipated by the Kawamura reference.

Q. Claim 32.

The Examiner rejected Claim 32 as being anticipated by the Matsumoto reference under 35 U.S.C. § 102(a).

1. The Matsumoto Reference.

Claim 32 depends from Claim 28. Claim 28 includes the limitation:

"a computer readable medium, said medium defining programming instructions ... said programming instructions being operable to classify said computation into at least one computation type, said at least one computation type being selected from the group consisting of quadrature computations, image edge detection computations, convolution computations, character string pattern matching computations, sorting computations, and computations for solving one or more differential equations."

Claim 32 includes the limitation:

"wherein said programming instructions define a routine to generate a cubic spline to provide at least one disguise function."

Section III.O.1 hereof explains why a "computer readable medium ... defining programming instructions ... said programming instructions being operable to classify" is not found in the Matsumoto reference. It is respectfully submitted that the Matsumoto reference also does not disclose a system that includes both a "computer readable medium ... defining programming instructions ... said programming instructions being operable to classify" where "said programming instructions define a routine to generate a cubic spline to provide at least one disguise function" as is claimed in Claim 32. Accordingly, it is respectfully submitted that Claim 32 is not anticipated by the Matsumoto reference.

R. Claim 33.

The Examiner rejected Claim 33 as being anticipated by the Matsumoto reference under 35 U.S.C. § 102(a). An amendment to Claim 33 is submitted herewith, although the amendment is not made for reasons related to the patentability of Claim 33.

1. **The Matsumoto Reference.**

Claim 33 depends from Claim 28. Claim 28 includes the limitation:

"a computer readable medium, said medium defining programming instructions ... said programming instructions being operable to classify said computation into at least one computation type, said at least one computation type being selected from the group consisting of quadrature computations, image edge detection computations, convolution computations, character string pattern matching computations, sorting computations, and computations for solving one or more differential equations."

Claim 33 includes the limitation:

"wherein said programming instructions define a routine to provide a pseudorandom function space to provide one or more disguise functions."

Section III.O.1. hereof explains why a "computer readable medium ... defining programming instructions ... said programming instructions being operable to classify" is not found in the Matsumoto reference. It is respectfully submitted that the Matsumoto reference also does not disclose a system that includes <u>both</u> a "computer readable medium ... defining programming instructions ... said programming instructions being operable to classify" and "said programming instructions define a routine to provide a pseudorandom function space to provide one or more disguise functions" as is claimed in Claim 33. Accordingly, it is respectfully submitted that Claim 33 is not anticipated by the Matsumoto reference.

S. Claim 36.

The Examiner rejected Claim 36 as being anticipated by the Matsumoto reference under

35 U.S.C. § 102(a). An amendment to Claim 36 is submitted herewith, although this amendment

is not made for reasons related to the patentability of Claim 36.

1. The Matsumoto Reference.

Claim 36 depends from Claim 1. Thus, Claim 36 inherits the limitations of Claim 1.

Section III.A.1 hereof explains why the limitation:

> "classifying, with a first computer, said outsourced computation into at least one
> computation type, said at least one computation type being selected from the
> group consisting of quadrature computations, image edge detection computations,
> convolution computations, character string pattern matching computations,
> sorting computations, and computations for solving one or more differential
> equations."

which appears in Claim 1, as amended, is not found in the Matsumoto reference. As

Claim 36 inherits the limitations of Claim 1, it is respectfully submitted that this limitation also is

not found in Claim 36. Accordingly, it is respectfully submitted that Claim 36 is not anticipated

by the Matsumoto reference.

T. Claim 37.

The Examiner rejected Claim 37 as being anticipated by both the Matsumoto reference

and the Kawamura reference under 35 U.S.C. § 102(a). An amendment to Claim 37 is submitted

herewith, although the amendment is not made for reasons relating to the patentability of Claim

37.

1. The Matsumoto Reference.

In support of his rejection of Claim 37 in view of the Matsumoto reference, the Examiner

cited Paragraphs 3 and 4 of the Matsumoto reference as disclosing the invention claimed by the

Applicants in Claim 37. Paragraph 3 of the Matsumoto reference discloses a technique for

decomposing a computation into smaller computations that can be executed more efficiently.

Paragraph 4 discloses the use of permutation to disguise matrix multiplication computations,

linear equation computations, and graph isomorphism computations. It is respectfully submitted

that Claim 37 is not anticipated by either Paragraph 3 or Paragraph 4 of the Matsumoto

reference.

"A claim is anticipated only if each and every [limitation] as set forth in the claim is

found, either expressly or inherently described, in a single prior art reference." MPEP § 2131

(citing Verdegaal Bros., 814 F.2d 637, 631 (Fed. Cir. 1987)). Claim 37, as amended, includes

limitations not found in the Matsumoto reference. Specifically, Claim 37, as amended, includes

the limitation:

> "preparing, in said memory of said first computer, at least two disguising
> matrices, each said disguising matrix being a sparse matrix comprising at least
> one non-zero disguising argument, wherein each said at least one non-zero
> disguising argument comprises a pseudorandom number."

It is respectfully submitted that the Matsumoto reference makes no disclosure of the use

of a "disguising matrix ... comprising at least one non-zero disguising argument, wherein each

said at least one non-zero disguising argument comprises a pseudorandom number" (emphasis

added).

Paragraph 4.1(a) of the Matsumoto reference discloses a technique for outsourcing the multiplication of two matrices A and B. According to the technique disclosed in the Matsumoto reference, permutation matrices are used to disguise matrices A and B prior to delivery of matrices A and B to another computer where the product of matrices A and B is computed.

Permutation matrices are known in the art to be matrices whose elements consist exclusively of "0's" and "1's", with each row and column of the matrix having exactly one "1", and the remainder of the matrix being populated by "0's". For example, a 3x3 permutation matrix is as follows:

$$P = \begin{pmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ 1 & 0 & 0 \end{pmatrix}$$

The use of a permutation matrix is the only technique disclosed in the Matsumoto reference for disguising a matrix prior to an outsourced matrix multiplication calculation. It will be appreciated by those of skill in the art that the effect of disguising a matrix A by the use of a permutation matrix in the manner disclosed by Matsumoto is merely to rearrange the numerical values of the matrix A. In other words, if matrix A is a 3x3 matrix having nine numerical values, the result of the permutation step is to move the values to other positions in the matrix. The Matsumoto technique does not have the effect of changing the numerical values of the matrix A to enhance the disguise of these values. Thus, the original matrix values are sent to the external computer, albeit in a different row and column location in the matrix.

Unlike the technique disclosed in the Matsumoto reference upon which the Examiner

based his rejection, the disguising matrices of Claim 37 utilize "pseudorandom number[s]."

Accordingly, the disguising matrices of Claim 37 <u>are not</u> permutation matrices. There is <u>no</u>

<u>requirement</u> that the disguising matrices of Claim 37 consist exclusively of "0's" and "1's", which

is contrary to the technique disclosed in the Matsumoto reference in which a permutation matrix

consisting exclusively of "0's" and "1's" is required.

Because the technique disclosed by Matsumoto discloses only the use of permutation

matrices, it is respectfully submitted that the Matsumoto reference makes no disclosure at all of

"disguising matrices" of the type required by Claim 37. Accordingly, it is respectfully submitted

that Claim 37, as amended, is not anticipated by the Matsumoto reference.

2. **The Kawamura Reference.**

The Kawamura reference discloses a client-server protocol for reducing computation time

for modular exponentiation problems. The disclosure of the Kawamura reference is limited to

problems involving modular exponentiation.

Claim 37, as amended, includes the limitations:

"providing, in a memory of a first computer, a first actual matrix M1 comprising a
first plurality of actual arguments, and a second actual matrix M2 comprising a
second plurality of actual arguments, wherein a multiplicative product of said first
actual matrix M1 and said second actual matrix M2 is desired;"

and

"preparing, in said memory of said first computer, at least two disguising
matrices, each said disguising matrix being a sparse matrix comprising at least
one non-zero disguising argument, wherein each said at least one non-zero
disguising argument comprises a pseudorandom number."

It is respectfully submitted that the Kawamura reference makes no disclosure at all of "providing" actual matrices or "preparing" disguising matrices. Accordingly, it is respectfully submitted that Claim 37, as amended, is not anticipated by the Kawamura reference.

U. Claim 38.

The Examiner rejected Claim 38 as being anticipated by both the Matsumoto reference and the Kawamura reference under 35 U.S.C. § 102(a). An amendment to Claim 38 is submitted herewith, although the amendment is not made for reasons relating to the patentability of Claim 39.

1. The Matsumoto Reference.

Claim 38 depends from Claim 37. Thus, Claim 38 inherits the limitations of Claim 37. Section III.T.1 hereof explains why the limitation:

> "preparing, in said memory of said first computer, at least two disguising matrices, each said disguising matrix being a sparse matrix comprising at least one non-zero disguising argument, wherein each said at least one non-zero disguising argument comprises a pseudorandom number"

which appears in Claim 37, as amended, is not found in the Matsumoto reference. As Claim 38 inherits the limitations of Claim 37, it is respectfully submitted that this limitation also is not found in Claim 38. Accordingly, it is respectfully submitted that Claim 38 is not anticipated by the Matsumoto reference.

2. The Kawamura Reference.

Claim 38 depends from Claim 37. Thus, Claim 38 inherits the limitations of Claim 37.

Section III.T.2 hereof explains why the limitations:

> "providing, in a memory of a first computer, a first actual matrix M1 comprising a first plurality of actual arguments, and a second actual matrix M2 comprising a second plurality of actual arguments, wherein a multiplicative product of said first actual matrix M1 and said second actual matrix M2 is desired;"

and

> "preparing, in said memory of said first computer, at least two disguising matrices, each said disguising matrix being a sparse matrix comprising at least one non-zero disguising argument, wherein each said at least one non-zero disguising argument comprises a pseudorandom number"

which appear in Claim 37, as amended, are not found in the Kawamura reference. As Claim 38 inherits the limitations of Claim 37, it is respectfully submitted that these limitations also is not found in Claim 38. Accordingly, it is respectfully submitted that Claim 38 is not anticipated by the Kawamura reference.

V. Claim 39.

The Examiner rejected Claim 39 as being anticipated by both the Matsumoto reference and the Kawamura reference under 35 U.S.C. § 102(a). An amendment to Claim 39 is submitted herewith, although the amendment is not made for reasons relating to the patentability of Claim 39.

1. **The Matsumoto Reference.**

Claim 39 depends from Claim 38. Thus, Claim 39 inherits the limitations of Claim 38.

Section III.T.1 hereof explains why the limitation:

> "preparing, in said memory of said first computer, at least two disguising matrices, each said disguising matrix being a sparse matrix comprising at least one non-zero disguising argument, wherein each said at least one non-zero disguising argument comprises a pseudorandom number"

which appears in Claim 38, as amended, is not found in the Matsumoto reference. As Claim 39 inherits the limitations of Claim 38, it is respectfully submitted that this limitation also is not found in Claim 39. Accordingly, it is respectfully submitted that Claim 39 is not anticipated by the Matsumoto reference.

2. **The Kawamura Reference.**

Claim 39 depends from Claim 38. Thus, Claim 39 inherits the limitations of Claim 38.

Section III.T.2 hereof explains why the limitations:

> "providing, in a memory of a first computer, a first actual matrix M1 comprising a first plurality of actual arguments, and a second actual matrix M2 comprising a second plurality of actual arguments, wherein a multiplicative product of said first actual matrix M1 and said second actual matrix M2 is desired;"

and

> "preparing, in said memory of said first computer, at least two disguising matrices, each said disguising matrix being a sparse matrix comprising at least one non-zero disguising argument, wherein each said at least one non-zero disguising argument comprises a pseudorandom number"

which appear in Claim 38, as amended, are not found in the Kawamura reference. As Claim 39 inherits the limitations of Claim 38, it is respectfully submitted that these limitations

also is not found in Claim 39. Accordingly, it is respectfully submitted that Claim 39 is not anticipated by the Kawamura reference.

W. Claim 40.

The Examiner rejected Claim 40 as being anticipated by both the Matsumoto reference and the Kawamura reference under 35 U.S.C. § 102(a). An amendment to Claim 40 is submitted herewith, although the amendment is not made for reasons relating to the patentability of Claim 40.

1. The Matsumoto Reference.

Claim 40 depends from Claim 38. Thus, Claim 40 inherits the limitations of Claim 38. Section III.T.1 hereof explains why the limitation:

> "preparing, in said memory of said first computer, at least two disguising matrices, each said disguising matrix being a sparse matrix comprising at least one non-zero disguising argument, wherein each said at least one non-zero disguising argument comprises a pseudorandom number"

which appears in Claim 38, as amended, is not found in the Matsumoto reference. As Claim 40 inherits the limitations of Claim 38, it is respectfully submitted that this limitation also is not found in Claim 40. Accordingly, it is respectfully submitted that Claim 40 is not anticipated by the Matsumoto reference.

2. The Kawamura Reference.

Claim 40 depends from Claim 38. Thus, Claim 40 inherits the limitations of Claim 38. Section III.T.2 hereof explains why the limitations:

"providing, in a memory of a first computer, a first actual matrix M1 comprising a first plurality of actual arguments, and a second actual matrix M2 comprising a second plurality of actual arguments, wherein a multiplicative product of said first actual matrix M1 and said second actual matrix M2 is desired;"

and

"preparing, in said memory of said first computer, at least two disguising matrices, each said disguising matrix being a sparse matrix comprising at least one non-zero disguising argument, wherein each said at least one non-zero disguising argument comprises a pseudorandom number"

which appear in Claim 38, as amended, are not found in the Kawamura reference. As Claim 40 inherits the limitations of Claim 38, it is respectfully submitted that these limitations also is not found in Claim 40. Accordingly, it is respectfully submitted that Claim 40 is not anticipated by the Kawamura reference.

X. Claim 41.

The Examiner rejected Claim 41 as being anticipated by both the Matsumoto reference and the Kawamura reference under 35 U.S.C. § 102(a).

1. The Matsumoto Reference.

Claim 41 depends from Claim 37. Thus, Claim 41 inherits the limitations of Claim 37. Section III.T.1 hereof explains why the limitation:

"preparing, in said memory of said first computer, at least two disguising matrices, each said disguising matrix being a sparse matrix comprising at least one non-zero disguising argument, wherein each said at least one non-zero disguising argument comprises a pseudorandom number"

which appears in Claim 37, as amended, is not found in the Matsumoto reference. As Claim 41 inherits the limitations of Claim 37, it is respectfully submitted that this limitation also

is not found in Claim 41. Accordingly, it is respectfully submitted that Claim 41 is not

anticipated by the Matsumoto reference.

2. The Kawamura Reference.

Claim 41 depends from Claim 37. Thus, Claim 41 inherits the limitations of Claim 37.

Section III.T.2 hereof explains why the limitations:

> "providing, in a memory of a first computer, a first actual matrix M1 comprising a first plurality of actual arguments, and a second actual matrix M2 comprising a second plurality of actual arguments, wherein a multiplicative product of said first actual matrix M1 and said second actual matrix M2 is desired;"

> and

> "preparing, in said memory of said first computer, at least two disguising matrices, each said disguising matrix being a sparse matrix comprising at least one non-zero disguising argument, wherein each said at least one non-zero disguising argument comprises a pseudorandom number"

which appear in Claim 37, as amended, are not found in the Kawamura reference. As

Claim 41 inherits the limitations of Claim 37, it is respectfully submitted that these limitations

also is not found in Claim 41. Accordingly, it is respectfully submitted that Claim 41 is not

anticipated by the Kawamura reference.

Y. Claim 42.

The Examiner rejected Claim 42 as being anticipated by both the Matsumoto reference

and the Kawamura reference under 35 U.S.C. § 102(a).

1. **The Matsumoto Reference.**

Claim 42 depends from Claim 37. Thus, Claim 42 inherits the limitations of Claim 37.

Section III.T.1 hereof explains why the limitation:

> "preparing, in said memory of said first computer, at least two disguising matrices, each said disguising matrix being a sparse matrix comprising at least one non-zero disguising argument, wherein each said at least one non-zero disguising argument comprises a pseudorandom number"

which appears in Claim 37, as amended, is not found in the Matsumoto reference. As Claim 42 inherits the limitations of Claim 37, it is respectfully submitted that this limitation also is not found in Claim 42. Accordingly, it is respectfully submitted that Claim 42 is not anticipated by the Matsumoto reference.

2. **The Kawamura Reference.**

Claim 42 depends from Claim 37. Thus, Claim 42 inherits the limitations of Claim 37.

Section III.T.2 hereof explains why the limitations:

> "providing, in a memory of a first computer, a first actual matrix M1 comprising a first plurality of actual arguments, and a second actual matrix M2 comprising a second plurality of actual arguments, wherein a multiplicative product of said first actual matrix M1 and said second actual matrix M2 is desired;"

and

> "preparing, in said memory of said first computer, at least two disguising matrices, each said disguising matrix being a sparse matrix comprising at least one non-zero disguising argument, wherein each said at least one non-zero disguising argument comprises a pseudorandom number"

which appear in Claim 37, as amended, are not found in the Kawamura reference. As Claim 42 inherits the limitations of Claim 37, it is respectfully submitted that these limitations

also is not found in Claim 42. Accordingly, it is respectfully submitted that Claim 42 is not anticipated by the Kawamura reference.

Z. Claim 43.

The Examiner rejected Claim 43 as being anticipated by both the Matsumoto reference and the Kawamura reference under 35 U.S.C. § 102(a). An amendment to Claim 43 is submitted herewith, although the amendment is not made for reasons relating to the patentability of Claim 43.

1. The Matsumoto Reference.

Claim 43 depends from Claim 37. Thus, Claim 43 inherits the limitations of Claim 37. Section III.T.1 hereof explains why the limitation:

> "preparing, in said memory of said first computer, at least two disguising matrices, each said disguising matrix being a sparse matrix comprising at least one non-zero disguising argument, wherein each said at least one non-zero disguising argument comprises a pseudorandom number"

which appears in Claim 37, as amended, is not found in the Matsumoto reference. As Claim 43 inherits the limitations of Claim 37, it is respectfully submitted that this limitation also is not found in Claim 43. Accordingly, it is respectfully submitted that Claim 43 is not anticipated by the Matsumoto reference.

2. The Kawamura Reference.

Claim 43 depends from Claim 37. Thus, Claim 43 inherits the limitations of Claim 37. Section III.T.2 hereof explains why the limitations:

"providing, in a memory of a first computer, a first actual matrix M1 comprising a first plurality of actual arguments, and a second actual matrix M2 comprising a second plurality of actual arguments, wherein a multiplicative product of said first actual matrix M1 and said second actual matrix M2 is desired;"

and

"preparing, in said memory of said first computer, at least two disguising matrices, each said disguising matrix being a sparse matrix comprising at least one non-zero disguising argument, wherein each said at least one non-zero disguising argument comprises a pseudorandom number"

which appear in Claim 37, as amended, are not found in the Kawamura reference. As Claim 43 inherits the limitations of Claim 37, it is respectfully submitted that these limitations also is not found in Claim 43. Accordingly, it is respectfully submitted that Claim 43 is not anticipated by the Kawamura reference.

AA.   Claim 44.

The Examiner rejected Claim 44 as being anticipated by both the Matsumoto reference and the Kawamura reference under 35 U.S.C. § 102(a). An amendment to Claim 44 is submitted herewith, although the amendment is not made for reasons relating to the patentability of Claim 44.

1. The Matsumoto Reference.

Claim 44 depends from Claim 37. Thus, Claim 44 inherits the limitations of Claim 37. Section III.T.1 hereof explains why the limitation:

"preparing, in said memory of said first computer, at least two disguising matrices, each said disguising matrix being a sparse matrix comprising at least

one non-zero disguising argument, wherein each said at least one non-zero disguising argument comprises a pseudorandom number"

which appears in Claim 37, as amended, is not found in the Matsumoto reference. As Claim 44 inherits the limitations of Claim 37, it is respectfully submitted that this limitation also is not found in Claim 44. Accordingly, it is respectfully submitted that Claim 44 is not anticipated by the Matsumoto reference.

2. The Kawamura Reference.

Claim 44 depends from Claim 37. Thus, Claim 44 inherits the limitations of Claim 37. Section III.T.2 hereof explains why the limitations:

"providing, in a memory of a first computer, a first actual matrix M1 comprising a first plurality of actual arguments, and a second actual matrix M2 comprising a second plurality of actual arguments, wherein a multiplicative product of said first actual matrix M1 and said second actual matrix M2 is desired;"

and

"preparing, in said memory of said first computer, at least two disguising matrices, each said disguising matrix being a sparse matrix comprising at least one non-zero disguising argument, wherein each said at least one non-zero disguising argument comprises a pseudorandom number"

which appear in Claim 37, as amended, are not found in the Kawamura reference. As Claim 44 inherits the limitations of Claim 37, it is respectfully submitted that these limitations also is not found in Claim 44. Accordingly, it is respectfully submitted that Claim 44 is not anticipated by the Kawamura reference.

BB. **Claim 45.**

The Examiner rejected Claim 45 as being anticipated by both the Matsumoto reference

and the Kawamura reference under 35 U.S.C. § 102(a). An amendment to Claim 45 is submitted

herewith, although the amendment is not made for reasons relating to the patentability of Claim

45.

1. The Matsumoto Reference.

Claim 45 depends from Claim 37. Thus, Claim 45 inherits the limitations of Claim 37.

Section III.T.1 hereof explains why the limitation:

> "preparing, in said memory of said first computer, at least two disguising
> matrices, each said disguising matrix being a sparse matrix comprising at least
> one non-zero disguising argument, wherein each said at least one non-zero
> disguising argument comprises a pseudorandom number"

which appears in Claim 37, as amended, is not found in the Matsumoto reference. As

Claim 45 inherits the limitations of Claim 37, it is respectfully submitted that this limitation also

is not found in Claim 45. Accordingly, it is respectfully submitted that Claim 45 is not

anticipated by the Matsumoto reference.

2. The Kawamura Reference.

Claim 45 depends from Claim 37. Thus, Claim 45 inherits the limitations of Claim 37.

Section III.T.2 hereof explains why the limitations:

> "providing, in a memory of a first computer, a first actual matrix M1 comprising a
> first plurality of actual arguments, and a second actual matrix M2 comprising a
> second plurality of actual arguments, wherein a multiplicative product of said first
> actual matrix M1 and said second actual matrix M2 is desired;"

and

"preparing, in said memory of said first computer, at least two disguising matrices, each said disguising matrix being a sparse matrix comprising at least one non-zero disguising argument, wherein each said at least one non-zero disguising argument comprises a pseudorandom number"

which appear in Claim 37, as amended, are not found in the Kawamura reference. As Claim 45 inherits the limitations of Claim 37, it is respectfully submitted that these limitations also is not found in Claim 45. Accordingly, it is respectfully submitted that Claim 45 is not anticipated by the Kawamura reference.

CC.   Claim 46.

The Examiner rejected Claim 46 as being anticipated by both the Matsumoto reference and the Kawamura reference under 35 U.S.C. § 102(a).

1. The Matsumoto Reference.

Claim 46 depends from Claim 45. Thus, Claim 46 inherits the limitations of Claim 45. Section III.T.1 hereof explains why the limitation:

"preparing, in said memory of said first computer, at least two disguising matrices, each said disguising matrix being a sparse matrix comprising at least one non-zero disguising argument, wherein each said at least one non-zero disguising argument comprises a pseudorandom number"

which appears in Claim 45, as amended, is not found in the Matsumoto reference. As Claim 46 inherits the limitations of Claim 45, it is respectfully submitted that this limitation also is not found in Claim 46. Accordingly, it is respectfully submitted that Claim 46 is not anticipated by the Matsumoto reference.

2. **The Kawamura Reference.**

Claim 46 depends from Claim 45. Thus, Claim 46 inherits the limitations of Claim 45.

Section III.T.2 hereof explains why the limitations:

> "providing, in a memory of a first computer, a first actual matrix M1 comprising a first plurality of actual arguments, and a second actual matrix M2 comprising a second plurality of actual arguments, wherein a multiplicative product of said first actual matrix M1 and said second actual matrix M2 is desired;"

and

> "preparing, in said memory of said first computer, at least two disguising matrices, each said disguising matrix being a sparse matrix comprising at least one non-zero disguising argument, wherein each said at least one non-zero disguising argument comprises a pseudorandom number"

which appear in Claim 45, as amended, are not found in the Kawamura reference. As Claim 46 inherits the limitations of Claim 45, it is respectfully submitted that these limitations also is not found in Claim 46. Accordingly, it is respectfully submitted that Claim 46 is not anticipated by the Kawamura reference.

DD. **Claim 47.**

The Examiner rejected Claim 47 as being anticipated by both the Matsumoto reference and the Kawamura reference under 35 U.S.C. § 102(a).

1. **The Matsumoto Reference.**

Claim 47 depends from Claim 45. Thus, Claim 47 inherits the limitations of Claim 45.

Section III.T.1 hereof explains why the limitation:

> "preparing, in said memory of said first computer, at least two disguising matrices, each said disguising matrix being a sparse matrix comprising at least

one non-zero disguising argument, wherein each said at least one non-zero disguising argument comprises a pseudorandom number"

which appears in Claim 45, as amended, is not found in the Matsumoto reference. As Claim 47 inherits the limitations of Claim 45, it is respectfully submitted that this limitation also is not found in Claim 47. Accordingly, it is respectfully submitted that Claim 47 is not anticipated by the Matsumoto reference.

2. **The Kawamura Reference.**

Claim 47 depends from Claim 45. Thus, Claim 47 inherits the limitations of Claim 45. Section III.T.2 hereof explains why the limitations:

"providing, in a memory of a first computer, a first actual matrix M1 comprising a first plurality of actual arguments, and a second actual matrix M2 comprising a second plurality of actual arguments, wherein a multiplicative product of said first actual matrix M1 and said second actual matrix M2 is desired;"

and

"preparing, in said memory of said first computer, at least two disguising matrices, each said disguising matrix being a sparse matrix comprising at least one non-zero disguising argument, wherein each said at least one non-zero disguising argument comprises a pseudorandom number"

which appear in Claim 45, as amended, are not found in the Kawamura reference. As Claim 47 inherits the limitations of Claim 45, it is respectfully submitted that these limitations also is not found in Claim 47. Accordingly, it is respectfully submitted that Claim 47 is not anticipated by the Kawamura reference.

EE. Claim 48.

The Examiner rejected Claim 48 as being anticipated by both the Matsumoto reference and the Kawamura reference under 35 U.S.C. § 102(a). An amendment to Claim 48 is submitted herewith, although the amendment is not made for reasons relating to the patentability of Claim 48.

1. The Matsumoto Reference.

Claim 48 depends from Claim 45. Thus, Claim 48 inherits the limitations of Claim 45. Section III.T.1 hereof explains why the limitation:

> "preparing, in said memory of said first computer, at least two disguising matrices, each said disguising matrix being a sparse matrix comprising at least one non-zero disguising argument, wherein each said at least one non-zero disguising argument comprises a pseudorandom number"

which appears in Claim 45, as amended, is not found in the Matsumoto reference. As Claim 48 inherits the limitations of Claim 45, it is respectfully submitted that this limitation also is not found in Claim 48. Accordingly, it is respectfully submitted that Claim 48 is not anticipated by the Matsumoto reference.

2. The Kawamura Reference.

Claim 48 depends from Claim 45. Thus, Claim 48 inherits the limitations of Claim 45. Section III.T.2 hereof explains why the limitations:

> "providing, in a memory of a first computer, a first actual matrix M1 comprising a first plurality of actual arguments, and a second actual matrix M2 comprising a second plurality of actual arguments, wherein a multiplicative product of said first actual matrix M1 and said second actual matrix M2 is desired;"

and

"preparing, in said memory of said first computer, at least two disguising matrices, each said disguising matrix being a sparse matrix comprising at least one non-zero disguising argument, wherein each said at least one non-zero disguising argument comprises a pseudorandom number"

which appear in Claim 45, as amended, are not found in the Kawamura reference. As Claim 48 inherits the limitations of Claim 45, it is respectfully submitted that these limitations also is not found in Claim 48. Accordingly, it is respectfully submitted that Claim 48 is not anticipated by the Kawamura reference.

FF. Claim 49.

The Examiner rejected Claim 49 as being anticipated by both the Matsumoto reference and the Kawamura reference under 35 U.S.C. § 102(a). An amendment to Claim 49 is submitted herewith, although the amendment is not made for reasons relating to the patentability of Claim 49.

1. The Matsumoto Reference.

Claim 49 depends from Claim 45. Thus, Claim 49 inherits the limitations of Claim 45. Section III.T.1 hereof explains why the limitation:

"preparing, in said memory of said first computer, at least two disguising matrices, each said disguising matrix being a sparse matrix comprising at least one non-zero disguising argument, wherein each said at least one non-zero disguising argument comprises a pseudorandom number"

which appears in Claim 45, as amended, is not found in the Matsumoto reference. As Claim 49 inherits the limitations of Claim 45, it is respectfully submitted that this limitation also

is not found in Claim 49. Accordingly, it is respectfully submitted that Claim 49 is not

anticipated by the Matsumoto reference.

2. The Kawamura Reference.

Claim 49 depends from Claim 45. Thus, Claim 49 inherits the limitations of Claim 45.

Section III.T.2 hereof explains why the limitations:

> "providing, in a memory of a first computer, a first actual matrix M1 comprising a first plurality of actual arguments, and a second actual matrix M2 comprising a second plurality of actual arguments, wherein a multiplicative product of said first actual matrix M1 and said second actual matrix M2 is desired;"

and

> "preparing, in said memory of said first computer, at least two disguising matrices, each said disguising matrix being a sparse matrix comprising at least one non-zero disguising argument, wherein each said at least one non-zero disguising argument comprises a pseudorandom number"

which appear in Claim 45, as amended, are not found in the Kawamura reference. As

Claim 49 inherits the limitations of Claim 45, it is respectfully submitted that these limitations

also is not found in Claim 49. Accordingly, it is respectfully submitted that Claim 49 is not

anticipated by the Kawamura reference.

IV. Claims are not Obvious in View of the Casanova/Abadi References.

The Examiner Claims 1-2, 13-14, 18, 20, 24-25, 28-29, and 37-49 under 35 U.S.C.

§103(a) as being unpatentable over the Casanova reference in view of the Abadi reference. To

sustain a conclusion that a patent claim is obvious in view of two or more references, the

Examiner must establish a *prima facie* case of obviousness. Three criteria must be met to

establish a *prima facie* case of obviousness: (i) there must be some suggestion or motivation to combine the teachings of two or more references; (ii) there must be a reasonable expectation of success; and (iii) the references, when combined, must teach all the claim limitations. MPEP § 2143. It is respectfully submitted that the Examiner's rejections of Claims 1-2, 18, 20, 28-29, and 37-49 under 35 U.S.C. § 103(a) should be withdrawn because the Examiner has failed to properly establish a *prima facie* case of obviousness in support of any of these rejections.

In rejecting Claims 1-2, 18, 20, 28-29, and 37-49 under 35 U.S.C. §103(a), the Examiner cites the combination of the Casanova reference and the Abadi reference. To justify the rejections, the Examiner extracted isolated passages from the cited references, and then recited a combination of such passages that the Examiner purported to disclose all limitations of Claims 1-2, 18, 20, 28-29, and 37-49.

It is respectfully submitted that the Examiner has failed to establish that "the prior art references, when combined, must teach all the claim limitations" as is required when establishing a *prima facie* case of obviousness. MPEP § 2143. Claims 1-2, 18, 20, 28-29, and 37-49 each include many specific limitations. The Examiner did not offer any explanation to indicate where in the Casanova reference and/or the Abadi reference each particular limitation of each of Claims 1-2, 18, 20, 28-29, and 37-49 can be found. Instead, the Examiner merely provided a brief synopsis of the teachings the Casanova reference and the Abadi references, and then concluded that <u>all limitations of all of these claims</u> can be found in the brief teachings cited by the Examiner. This simply is not the case.

It is also respectfully submitted that the Examiner has not shown a "suggestion or motivation" in either of the references that supports the Examiner's contention that the combination of references is obvious. This also is required when establishing a *prima facie* case of obviousness. MPEP § 2143. Instead, the Examiner relies only on the statement "[i]t would have been obvious to one with ordinary skill in the art at the time of invention to include the teachings of Abadi's hiding information from an oracle with Casanova's netsolve system." The Examiner then justifies his conclusion that the combination of chosen references is obvious by stating a benefit that may be achieved from such a combination of references: "to gain the advantage of resources offered by a computing center without having to reveal confidential data."

"The mere fact that references <u>can</u> be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination." MPEP § 2143.01 (citing <u>In re Mills</u>, 916 F.2d 680 (Fed. Cir. 1990) (emphasis in the original)). "Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art." <u>Id</u>. "The level of skill in the art cannot be relied upon to provide the suggestion to combine references." <u>Id</u>. (citing <u>Al-Site Corp. v. BSI International, Inc.</u>, 174 F.3d 1308 (Fed. Cir. 1999)).

With respect to each of Claims 1-2, 18, 20, 28-29, and 37-49, it is respectfully submitted that the Examiner has neither (i) identified any suggestion or motivation for combining the two

references in the manner recited by the Examiner in support of each rejection; nor (ii) established that the prior art references, when combined, teach all the claim limitations. Accordingly, it is respectfully submitted that with respect to Claims 1-2, 18, 20, 28-29, and 37-49, in each case the Examiner has failed to establish a *prima facie* case of obviousness. MPEP § 2143. Thus, it is respectfully requested that the Examiner's rejections of Claims 1-2, 18, 20, 28-29, and 37-49 under 35 U.S.C. §103(a) be withdrawn.

V.   Claims 50-82 are Directed to Statutory Subject Matter.

For a process that performs a mathematical algorithm to be statutory subject matter under 35 U.S.C. § 101, "the claimed process must be limited to a practical application of the ... mathematical algorithm." MPEP § 2106.IV.B.2(b)(ii), citing In re Alappat, 33 F.3d 1526 (Fed Cir. 1994). "[A] machine claim is statutory when the machine, as claimed, produces a concrete, tangible, and useful result." Id., citing State Street Bank & Trust Co. v. Signature Financial Group, Inc., 149 F.3d 1368 (Fed. Cir. 1998).

A. Claim 50.

The Examiner rejected Claim 50 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. An amendment to Claim 50 is submitted herewith.

Claim 50, as amended, is directed toward a method for outsourcing a matrix inversion computation from a first computer to a second computer. Thus, the matrix inversion computation is prepared by the first computer and performed, at least in part, by the second

computer. In such a scenario, it often is desired not to reveal the true contents of the matrix to the second computer for various practical reasons such as, for example, security or confidentiality. The method claimed in Claim 50 provides a method for accomplishing the disguise of the matrix prior to its delivery to the second computer. This act of disguising the contents of the matrix prior to delivery of the matrix to the second computer accomplishes the practical step of "hindering discovery of the contents of the matrix by the second computer."

The method for outsourcing a matrix inversion computation as claimed in amended Claim 50 involves a mathematical algorithm. However, it is the practical application of that mathematical algorithm within the process of disguising the matrix that is claimed. Accordingly, Claim 50, as amended, is limited to a process that is patentable subject matter under 35 U.S.C. § 101.

B. Claim 51.

The Examiner rejected Claim 51 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. An amendment to Claim 51 is submitted herewith, although this amendment is not made for reasons related to the patentability of Claim 51.

Claim 51 depends from Claim 50. Thus, Claim 51 inherits the limitations of Claim 50. Section V.A hereof explains why Claim 50 is limited to a process that is patentable subject matter under 35 U.S.C. § 101. Accordingly, Claim 51 also is limited to a process that is patentable subject matter under 35 U.S.C. § 101.

C. **Claim 52.**

The Examiner rejected Claim 52 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. An amendment to Claim 52 is submitted herewith, although this amendment is not made for reasons related to the patentability of Claim 52.

Claim 52 depends from Claim 50. Thus, Claim 52 inherits the limitations of Claim 50. Section V.A hereof explains why Claim 50 is limited to a process that is patentable subject matter under 35 U.S.C. § 101. Accordingly, Claim 52 also is limited to a process that is patentable subject matter under 35 U.S.C. § 101.

D. **Claim 53.**

The Examiner rejected Claim 53 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. An amendment to Claim 53 is submitted herewith, although this amendment is not made for reasons related to the patentability of Claim 53.

Claim 53 depends from Claim 50. Thus, Claim 53 inherits the limitations of Claim 50. Section V.A hereof explains why Claim 50 is limited to a process that is patentable subject matter under 35 U.S.C. § 101. Accordingly, Claim 53 also is limited to a process that is patentable subject matter under 35 U.S.C. § 101.

E. **Claim 54.**

The Examiner rejected Claim 54 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. An amendment to Claim 54 is submitted herewith.

Claim 54, as amended, is directed toward a method for outsourcing the computation of a solution vector for a system of linear equations of the form Mx=b from a first computer to a second computer. In such a scenario, it often is desired not to reveal the true contents of the system of linear equations to the second computer for various practical reasons such as, for example, security or confidentiality. The method claimed in Claim 54 provides a method for accomplishing the disguise of the system of linear equations prior to its delivery to the second computer. This act of disguising the contents of the system of linear equations prior to delivery of the system of linear equations to the second computer accomplishes the practical step of "hindering discovery of the system of linear equations by the second computer."

The method for outsourcing the computation of a solution vector for a system of linear equations as claimed in amended Claim 54 involves a mathematical algorithm. However, it is the practical application of that mathematical algorithm within the process of disguising the system of linear equations that is claimed. Accordingly, Claim 54, as amended, is limited to a process that is patentable subject matter under 35 U.S.C. § 101.

F. Claim 55.

The Examiner rejected Claim 55 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. An amendment to Claim 55 is submitted herewith.

Claim 55, as amended, is directed toward a method for outsourcing the computation of a solution vector for a system of linear equations of the form Mx=b from a first computer to a second computer. In such a scenario, it often is desired not to reveal the true contents of the

system of linear equations to the second computer for various practical reasons such as, for example, security or confidentiality. The method claimed in Claim 55 provides a method for accomplishing the disguise of the system of linear equations prior to its delivery to the second computer. This act of disguising the contents of the system of linear equations prior to delivery of the system of linear equations to the second computer accomplishes the practical step of "hindering discovery of the system of linear equations by the second computer."

The method for outsourcing the computation of a solution vector for a system of linear equations as claimed in amended Claim 55 involves a mathematical algorithm. However, it is the practical application of that mathematical algorithm within the process of disguising the system of linear equations that is claimed. Accordingly, Claim 55, as amended, is limited to a process that is patentable subject matter under 35 U.S.C. § 101.

G. Claim 56.

The Examiner rejected Claim 56 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. An amendment to Claim 56 is submitted herewith.

Claim 56, as amended, is directed toward a method for outsourcing the computation of an estimate for the solution of a quadrature computation from a first computer to a second computer. In such a scenario, it often is desired not to reveal the true contents of a function $f(x)$ involved in the quadrature computation to the second computer for various practical reasons such as, for example, security or confidentiality. The method claimed in Claim 56 provides a method for accomplishing the disguise of the function $f(x)$ prior to its delivery to the second computer.

This act of disguising the function f(x) prior to delivery of the function f(x) to the second computer accomplishes the practical step of "hindering discovery of the function f(x) by the second computer."

The method for outsourcing the computation of an estimate for the solution of a quadrature computation as claimed in amended Claim 56 involves a mathematical algorithm. However, it is the practical application of that mathematical algorithm within the process of disguising the function f(x) that is claimed. Accordingly, Claim 56, as amended, is limited to a process that is patentable subject matter under 35 U.S.C. § 101.

H. Claim 57.

The Examiner rejected Claim 57 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. An amendment to Claim 57 is submitted herewith.

Claim 57, as amended, is directed toward a method for outsourcing the solution of a convolution computation of two vectors from a first computer to a second computer. In such a scenario, it often is desired not to reveal the true contents of the two vectors to the second computer for various practical reasons such as, for example, security or confidentiality. The method claimed in Claim 57 provides a method for accomplishing the disguise of the two vectors prior to its delivery to the second computer. This act of disguising the two vectors prior to delivery of the two vectors to the second computer accomplishes the practical step of "hindering discovery of the contents of the vectors by the second computer."

The method for outsourcing the solution of a convolution computation of two vectors as claimed in amended Claim 57 involves a mathematical algorithm. However, it is the practical application of that mathematical algorithm within the process of disguising the two vectors that is claimed. Accordingly, Claim 57, as amended, is limited to a process that is patentable subject matter under 35 U.S.C. § 101.

I. Claim 58.

The Examiner rejected Claim 58 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. An amendment to Claim 58 is submitted herewith, although this amendment is not made for reasons related to the patentability of Claim 58.

Claim 58 depends from Claim 57. Thus, Claim 58 inherits the limitations of Claim 57. Section V.H hereof explains why Claim 57 is limited to a process that is patentable subject matter under 35 U.S.C. § 101. Accordingly, Claim 58 also is limited to a process that is patentable subject matter under 35 U.S.C. § 101.

J. Claim 59.

The Examiner rejected Claim 59 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. An amendment to Claim 59 is submitted herewith.

Claim 59, as amended, is directed toward a method for outsourcing the computation of a solution of a solution to a linear differential equation from a first computer to a second computer. In such a scenario, it often is desired not to reveal the true contents of the linear differential

equation or its boundary conditions to the second computer for various practical reasons such as, for example, security or confidentiality. The method claimed in Claim 59 provides a method for accomplishing the disguise of the linear differential equation and its boundary conditions prior to its delivery to the second computer. This act of disguising the linear differential equation and its boundary conditions prior to delivery of the linear differential equation and its boundary conditions to the second computer accomplishes the practical step of "hindering discovery of the linear differential equation and boundary conditions by the second computer."

The method for outsourcing the computation of a solution of a solution to a linear differential equation as claimed in amended Claim 59 involves a mathematical algorithm. However, it is the practical application of that mathematical algorithm within the process of disguising the linear differential equation and boundary conditions that is claimed. Accordingly, Claim 59, as amended, is limited to a process that is patentable subject matter under 35 U.S.C. § 101.

K. Claim 60.

The Examiner rejected Claim 60 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. An amendment to Claim 60 is submitted herewith, although this amendment is not made for reasons related to the patentability of Claim 60.

Claim 60, as amended, does not recite the use of a mathematical algorithm. Accordingly, Claim 60, as amended is limited to a process that is patentable subject matter under 35 U.S.C. § 101.

L. <u>Claim 61.</u>

The Examiner rejected Claim 61 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. An amendment to Claim 61 is submitted herewith, although this amendment is not made for reasons related to the patentability of Claim 61.

Claim 61, as amended, does not recite the use of a mathematical algorithm. Accordingly, Claim 61, as amended is limited to a process that is patentable subject matter under 35 U.S.C. § 101.

M. <u>Claim 62.</u>

The Examiner rejected Claim 62 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. An amendment to Claim 62 is submitted herewith.

Claim 62, as amended, is directed toward a method for analyzing a digital image wherein a computation for detecting edges of the digital image is outsourced from a first computer to a second computer. In such a scenario, it often is desired not to reveal the actual digital image to the second computer for various practical reasons such as, for example, security or confidentiality. The method claimed in Claim 62 provides a method for accomplishing the disguise of the digital image prior to its delivery to the second computer. This act of disguising the digital image prior to delivery of the digital image to the second computer accomplishes the practical step of "hindering discovery of the digital image by the second computer."

The method for analyzing a digital image as claimed in amended Claim 62 involves a mathematical algorithm. However, it is the practical application of that mathematical algorithm within the process of disguising the digital image that is claimed. Accordingly, Claim 62, as amended, is limited to a process that is patentable subject matter under 35 U.S.C. § 101.

N. Claim 63.

The Examiner rejected Claim 63 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. An amendment to Claim 63 is submitted herewith.

Claim 63, as amended, is directed toward a method for analyzing a digital image wherein the desired outcome of the analysis is an approximation of whether a particular digital image object appears in a larger digital image. A portion of the analysis is outsourced from a first computer to a second computer. In such a scenario, it often is desired not to reveal the actual digital image object or digital image to the second computer for various practical reasons such as, for example, security or confidentiality. The method claimed in Claim 63 provides a method for accomplishing the disguise of the digital image object and digital image prior to delivery to the second computer. This act of disguising the digital image object and digital image prior to delivery of the digital image object and digital image to the second computer accomplishes the practical step of "hindering discovery" of the digital image object and digital image by the second computer.

The method for analyzing a digital image as claimed in amended Claim 63 involves a mathematical algorithm. However, it is the practical application of that mathematical algorithm

within the process of disguising the digital image object and digital image that is claimed. Accordingly, Claim 63, as amended, is limited to a process that is patentable subject matter under 35 U.S.C. § 101.

O. Claim 64.

The Examiner rejected Claim 64 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. An amendment to Claim 64 is submitted herewith.

Claim 64, as amended, is directed toward a method for outsourcing the sorting of a plurality of numbers from a first computer to a second computer. In such a scenario, it often is desired not to reveal the actual numbers to the second computer for various practical reasons such as, for example, security or confidentiality. The method claimed in Claim 64 provides a method for accomplishing the disguise of the plurality of numbers prior to its delivery to the second computer. This act of disguising the plurality of numbers prior to delivery of the numbers to the second computer accomplishes the practical step of "hindering discovery of the plurality of numbers by the second computer."

The method for outsourcing the sorting of a plurality of numbers as claimed in amended Claim 64 involves a mathematical algorithm. However, it is the practical application of that mathematical algorithm within the process of disguising the plurality of numbers that is claimed. Accordingly, Claim 64, as amended, is limited to a process that is patentable subject matter under 35 U.S.C. § 101.

P. Claim 65.

The Examiner rejected Claim 65 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. An amendment to Claim 65 is submitted herewith.

Claim 65, as amended, is directed toward a method for text string analysis wherein it is desired to determine whether a text pattern appears in a larger text string. A portion of the analysis is outsourced from a first computer to a second computer. In such a scenario, it often is desired not to reveal the text pattern or text string to the second computer for various practical reasons such as, for example, security or confidentiality. The method claimed in Claim 65 provides a method for accomplishing the disguise of the text pattern and text string prior to delivery to the second computer. This act of disguising the text pattern and text string prior to delivery of the text pattern and text string to the second computer accomplishes the practical step of "hindering discovery of the text pattern and text string by the second computer."

The method for text string analysis as claimed in amended Claim 65 involves a mathematical algorithm. However, it is the practical application of that mathematical algorithm within the process of text pattern and text string of numbers that is claimed. Accordingly, Claim 65, as amended, is limited to a process that is patentable subject matter under 35 U.S.C. § 101.

Q. Claim 66.

The Examiner rejected Claim 66 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. An amendment to Claim 66 is submitted herewith.

Claim 66, as amended, is directed toward a first computer for disguising the contents of a matrix prior to delivery of the matrix to a second computer for a matrix multiplication computation. As noted above, a machine claim involving a mathematical algorithm is statutory subject matter when the "machine, as claimed, produces a concrete, tangible, and useful result." The first computer claimed in Claim 66 produces the concrete, tangible, and useful result of disguising a matrix prior to delivery of the matrix to a second computer for a computation. By virtue of the disguise, the true contents of the matrix are not revealed, preserving the security or confidentiality of the matrix contents. Accordingly, Claim 66, as amended, is directed to a machine that is patentable subject matter under 35 U.S.C. § 101.

R. Claim 67.

The Examiner rejected Claim 67 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. An amendment to Claim 67 is submitted herewith. Claim 67 depends from Claim 66. Thus, Claim 67 inherits the limitations of Claim 66. Section V.Q hereof explains why Claim 66 is directed to a machine that is patentable subject matter under 35 U.S.C. § 101. Accordingly, Claim 67 also is directed to a machine that is patentable subject matter under 35 U.S.C. § 101.

S. Claim 68.

The Examiner rejected Claim 68 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. An amendment to Claim 68 is submitted herewith.

Claim 68 depends from Claim 66. Thus, Claim 68 inherits the limitations of Claim 66. Section V.Q hereof explains why Claim 66 is directed to a machine that is patentable subject matter under 35 U.S.C. § 101. Accordingly, Claim 68 also is directed to a machine that is patentable subject matter under 35 U.S.C. § 101.

T. Claim 69.

The Examiner rejected Claim 69 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. An amendment to Claim 69 is submitted herewith.

Claim 69, as amended, is directed toward a computer for disguising a matrix prior to delivery of the matrix to another computer for a matrix inversion computation. A machine claim involving a mathematical algorithm is statutory subject matter when the "machine, as claimed, produces a concrete, tangible, and useful result." The computer claimed in Claim 69 produces the concrete, tangible, and useful result of disguising a matrix prior to delivery of the matrix to another computer for a computation. By virtue of the disguise, the true contents of the matrix are not revealed, preserving the security or confidentiality of the matrix contents. Accordingly, Claim 69, as amended, is directed to a machine that is patentable subject matter under 35 U.S.C. § 101.

U. Claim 70.

The Examiner rejected Claim 70 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. An amendment to Claim 70 is submitted herewith.

Claim 70 depends from Claim 69. Thus, Claim 70 inherits the limitations of Claim 69. Section V.V hereof explains why Claim 69 is directed to a machine that is patentable subject matter under 35 U.S.C. § 101. Accordingly, Claim 70 also is directed to a machine that is patentable subject matter under 35 U.S.C. § 101.

V. Claim 71.

The Examiner rejected Claim 71 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. An amendment to Claim 71 is submitted herewith.

Claim 71 depends from Claim 69. Thus, Claim 71 inherits the limitations of Claim 69. Section V.V hereof explains why Claim 69 is directed to a machine that is patentable subject matter under 35 U.S.C. § 101. Accordingly, Claim 71 also is directed to a machine that is patentable subject matter under 35 U.S.C. § 101.

W. Claim 72.

The Examiner rejected Claim 72 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. An amendment to Claim 72 is submitted herewith.

Claim 72, as amended, is directed toward a computer that is able to disguise a system of linear equations prior to delivery of the system of linear equations to another computer for computation of a solution vector. A machine claim involving a mathematical algorithm is statutory subject matter when the "machine, as claimed, produces a concrete, tangible, and useful result." The computer claimed in Claim 72 produces the concrete, tangible, and useful result of

disguising a system of linear equations prior to delivery of the system of linear equations to another computer for a computation. By virtue of the disguise, the true contents of the system of linear equations are not revealed, preserving the security or confidentiality of the system of linear equations. Accordingly, Claim 72, as amended, is directed to a machine that is patentable subject matter under 35 U.S.C. § 101.

X. Claim 73.

The Examiner rejected Claim 73 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. An amendment to Claim 73 is submitted herewith.

Claim 73, as amended, is directed toward a computer that is able to disguise a system of linear equations prior to delivery of the system of linear equations to another computer for computation of a solution vector. A machine claim involving a mathematical algorithm is statutory subject matter when the "machine, as claimed, produces a concrete, tangible, and useful result." The computer claimed in Claim 73 produces the concrete, tangible, and useful result of disguising a system of linear equations prior to delivery of the system of linear equations to another computer for a computation. By virtue of the disguise, the true contents of the system of linear equations are not revealed, preserving the security or confidentiality of the system of linear equations. Accordingly, Claim 73, as amended, is directed to a machine that is patentable subject matter under 35 U.S.C. § 101.

Y. <u>Claim 74.</u>

The Examiner rejected Claim 74 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. An amendment to Claim 74 is submitted herewith.

Claim 74, as amended, is directed toward a computer for use in disguising a function $f(x)$. A machine claim involving a mathematical algorithm is statutory subject matter when the "machine, as claimed, produces a concrete, tangible, and useful result." The computer claimed in Claim 74 produces the concrete, tangible, and useful result of disguising a function $f(x)$. By virtue of the disguise, the true function $f(x)$ is not revealed, preserving the security or confidentiality of the function $f(x)$. Accordingly, Claim 74, as amended, is directed to a machine that is patentable subject matter under 35 U.S.C. § 101.

Z. <u>Claim 75.</u>

The Examiner rejected Claim 75 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. An amendment to Claim 75 is submitted herewith.

Claim 75, as amended, is directed toward a computer for use in disguising two vectors prior to delivery of the vectors to another computer for a convolution computation. A machine claim involving a mathematical algorithm is statutory subject matter when the "machine, as claimed, produces a concrete, tangible, and useful result." The computer claimed in Claim 75 produces the concrete, tangible, and useful result of disguising two vectors prior to delivery of the system of the two vectors to another computer for a computation. By virtue of the disguise, the true contents of the two vectors are not revealed, preserving the security or confidentiality of

the two vectors. Accordingly, Claim 75, as amended, is directed to a machine that is patentable

subject matter under 35 U.S.C. § 101.

AA. Claim 76.

The Examiner rejected Claim 76 under 35 U.S.C. § 101 as being directed to non-statutory

subject matter. An amendment to Claim 76 is submitted herewith.

Claim 76, as amended, is directed toward a computer for use in disguising a linear

differential equation prior to delivery of the linear differential equation to another computer for a

computation. A machine claim involving a mathematical algorithm is statutory subject matter

when the "machine, as claimed, produces a concrete, tangible, and useful result." The computer

claimed in Claim 76 produces the concrete, tangible, and useful result of disguising the linear

differential equation prior to delivery of the linear differential equation to another computer for a

computation. By virtue of the disguise, the true contents of the linear differential equation are

not revealed, preserving the security or confidentiality of the linear differential equation.

Accordingly, Claim 76, as amended, is directed to a machine that is patentable subject matter

under 35 U.S.C. § 101.

BB. Claim 77.

The Examiner rejected Claim 77 under 35 U.S.C. § 101 as being directed to non-statutory

subject matter. An amendment to Claim 77 is submitted herewith, although this amendment is

not made for reasons related to the patentability of Claim 77. Claim 77, as amended, does not

involve the use of a mathematical algorithm. Accordingly, Claim 77, as amended is directed to a machine that is patentable subject matter under 35 U.S.C. § 101.

CC. Claim 78.

The Examiner rejected Claim 78 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. An amendment to Claim 78 is submitted herewith, although this amendment is not made for reasons related to the patentability of Claim 78. Claim 78, as amended, does not involve the use of a mathematical algorithm. Accordingly, Claim 78, as amended is directed to a machine that is patentable subject matter under 35 U.S.C. § 101.

DD. Claim 79.

The Examiner rejected Claim 79 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. An amendment to Claim 79 is submitted herewith.

Claim 79, as amended, is directed toward a first computer for use in analyzing a digital image wherein the digital image is disguised prior to delivery of the digital image to a second computer for a computation, "thereby hindering discovery of the digital image by the second computer and unauthorized parties."

A machine claim involving a mathematical algorithm is statutory subject matter when the "machine, as claimed, produces a concrete, tangible, and useful result." The computer claimed in Claim 79 produces the concrete, tangible, and useful result of disguising the digital image prior to delivery of the digital image to another computer for a computation. By virtue of the disguise,

the true digital image is not revealed, preserving the security or confidentiality of the digital image. Accordingly, Claim 79, as amended, is directed to a machine that is patentable subject matter under 35 U.S.C. § 101.

EE. Claim 80.

The Examiner rejected Claim 80 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. An amendment to Claim 80 is submitted herewith.

Claim 80, as amended, is directed toward a first computer for use in analyzing a digital image and a digital image object wherein the digital image and digital image object are disguised prior to delivery of the digital image and digital image object to a second computer for a computation, "thereby hindering discovery of the image object and the larger image by the second computer and unauthorized parties."

A machine claim involving a mathematical algorithm is statutory subject matter when the "machine, as claimed, produces a concrete, tangible, and useful result." The computer claimed in Claim 80 produces the concrete, tangible, and useful result of disguising the digital image and digital image object prior to delivery of the digital image and digital image object to another computer for a computation. By virtue of the disguise, the true the digital image and digital image object are not revealed, preserving the security or confidentiality of the digital image and digital image object. Accordingly, Claim 80, as amended, is directed to a machine that is patentable subject matter under 35 U.S.C. § 101.

FF. Claim 81.

The Examiner rejected Claim 81 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. An amendment to Claim 81 is submitted herewith.

Claim 81, as amended, is directed toward a computer for use in preparing a set of numbers to be sorted into a sequence by a second computer, wherein the set of numbers is disguised prior to delivery of the set of numbers to the second computer "thereby hindering discovery of the set of numbers by the second computer and unauthorized parties."

A machine claim involving a mathematical algorithm is statutory subject matter when the "machine, as claimed, produces a concrete, tangible, and useful result." The computer claimed in Claim 81 produces the concrete, tangible, and useful result of disguising the set of numbers prior to delivery of set of numbers to another computer for a computation. By virtue of the disguise, the true set of numbers are not revealed, preserving the security or confidentiality of set of numbers. Accordingly, Claim 81, as amended, is directed to a machine that is patentable subject matter under 35 U.S.C. § 101.

GG. Claim 82.

The Examiner rejected Claim 82 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. An amendment to Claim 82 is submitted herewith.

Claim 82, as amended, is directed toward a computer for use in text string analysis, , wherein the set of numbers is disguised prior to delivery of the set of numbers to the second

computer "thereby hindering discovery of the set of numbers by the second computer and unauthorized parties."

A machine claim involving a mathematical algorithm is statutory subject matter when the "machine, as claimed, produces a concrete, tangible, and useful result." The computer claimed in Claim 82 produces the concrete, tangible, and useful result of disguising the set of numbers prior to delivery of set of numbers to another computer for a computation. By virtue of the disguise, the true set of numbers are not revealed, preserving the security or confidentiality of set of numbers. Accordingly, Claim 82, as amended, is directed to a machine that is patentable subject matter under 35 U.S.C. § 101.

VI. New Claims 83-89 are Allowable.

Claim 83 depends from Claim 54. Claim 84 depends from claim 57. Claim 85 depends from claim 62. Claims 86-87 depend from Claim 63. Claim 88 depends from Claim 64. Claim 89 depends from Claim 65. As discussed above, the parent claim to each of these new dependent claims is patentable. Accordingly, each new independent claim also is patentable.

CONCLUSION

For all the foregoing reasons, it is respectfully submitted that Applicants have made a patentable contribution to the art and that this response places the above identified application in condition for allowance, or in the alternative this response places the application in a better form for appeal. Favorable reconsideration and allowance of this application is respectfully requested.

Should the Examiner continue to find any of the claims objectionable for any reason, the Examiner is respectfully requested to contact the undersigned for a telephone interview before taking further action.

Sincerely,

ICE MILLER

Thomas A. Walsh
Attorney Registration No. 45,196

cc: Karen White
       Eric Davis

Enclosures: Return postcard